

WHAT IS CLAIMED IS:

1                   1.       A computer-implemented method of storing multiple fields for  
2 multiple tenants in a single multi-tenant data structure, comprising:  
3                   defining a multi-tenant data structure having a plurality of data columns and  
4 one or more index columns;  
5                   defining a first data field for a first tenant, said first field having a first data  
6 type;  
7                   defining a second data field for a second tenant, said second field having a  
8 second data type, wherein the second data type is different than said first data type;  
9                   when records having data values in the first and second fields are created by  
10 the first and second tenants, storing the data values of first and second fields to a single  
11 column in the data structure, wherein the single column includes data values having different  
12 data types for different tenants; and  
13                   copying to a first one of the index columns the data values stored in the single  
14 data column for the first field in response to a request from the first tenant to index data in the  
15 first data field.

1                   2.       The method of claim 1, further comprising:  
2                   defining a separate data structure having one or more columns; and  
3                   in response to an indication from one of the first tenant and the second tenant  
4 that data in the first data field or second data field, respectively, be unique, copying the data  
5 values stored in the single data column corresponding to the first data field or second data  
6 field, respectively, to a column in the separate data structure.

1                   3.       The method of claim 1, wherein copying includes converting the  
2 copied data values to a modified format.

1                   4.       The method of claim 3, wherein converting includes applying a case  
2 folding algorithm to the data values.

1                   5.       A computer-implemented method of hosting multiple tables for one or  
2 more organizations in a single multi-tenant data structure, comprising:  
3                   defining a multi-tenant data structure having a primary key column, an  
4 organization id column and a plurality of data columns;

5 defining a first table for a first tenant, said first table having a first data field,  
6 and said first tenant having a first tenant id;  
7 assigning a first table id to the first table;  
8 defining a second table for a second tenant, said second table having a second  
9 data field, and said second tenant having a second tenant id;  
10 assigning a second table id to the second table;  
11 wherein when records are created for the first table by the first tenant, for each  
12 created record:  
13 a) storing the value of the first data field to a single data column in the  
14 data structure;  
15 b) storing the first tenant id in the organization id column; and  
16 c) storing the first table id to the primary key column; and  
17 wherein when records are created for the second table by the second tenant,  
18 for each created record:  
19 a) storing the value of the second data field to said single data column  
20 in the data structure;  
21 b) storing the second tenant id in the organization id column; and  
22 c) storing the second table id to the primary key column; and  
23 wherein the first and second tables of the first and second tenants are stored in  
24 the data structure.

1 6. The method of claim 5, wherein the data structure includes one or  
2 more index columns, the method further comprising:  
3 copying to a first one of the index columns the data values stored in the single  
4 data column for the first table in response to a request from the first tenant to index data in  
5 the first data field.

1 7. The method of claim 6, wherein copying includes identifying the data  
2 values to be copied based on the first tenant id, the first table id and the first data field.

1 8. The method of claim 5, wherein said first data field has a first data  
2 type, and wherein said second data field has a second data type different from the first data  
3 type, such that said single data column includes data values having said first and second data  
4 types.

1                   9.       A computer-implemented method of storing multiple tables for one or  
2 more tenants in a single data structure, comprising:  
3                   defining a data structure having a primary key column, an organization id  
4 column and a plurality of data columns;  
5                   defining a first table for a first tenant, said first table having a first data field,  
6 said first data field having a first data type, and said first tenant having a first tenant id;  
7                   assigning a first table id to the first table;  
8                   defining a second table for the first tenant, said second table having a second  
9 data field, said second data field having a second data type different from the first data type;  
10                  assigning a second table id to the second table;  
11                  wherein when records are created for the first table, for each created record:  
12                   a) storing the value of the first data field to a single data column in the  
13 data structure;  
14                   b) storing the first tenant id in the organization id column; and  
15                   c) storing the first table id to the primary key column; and  
16                  wherein when records are created for the second table, for each created record:  
17                   a) storing the value of the second data field to said single data column;  
18                   b) storing the first tenant id in the organization id column; and  
19                   c) storing the second table id to the primary key column;  
20                  wherein the first and second tables of the first tenant are stored in the data  
21 structure, and wherein said single data column includes data values having said first and  
22 second data types.

1                   10.     The method of claim 9, further comprising:  
2                   defining a third table for a second tenant, said third table having a third data  
3 field, said third data field having a third data type, and said second tenant having a second  
4 tenant id; and  
5                   assigning a third table id to the third table;  
6                   wherein when records are created for the third table, for each created record:  
7                   storing the value of the third data field to said single data column in the  
8 data structure;  
9                   storing the second tenant id in the organization id column; and  
10                  storing the third table id to the primary key column;

11                    wherein the first, second and third tables are stored in the data structure, and  
12 wherein said single data column includes data values having said first and second data types  
13 and said third data type.

1                    11.     The method of claim 9, wherein the first and second table ids are  
2 different.

1                    12.     The method of claim 10, wherein the first and second table ids are  
2 different, and wherein the third table id is the same as one of the first and second table ids.

1                    13.     The method of claim 9, wherein the data structure includes one or  
2 more index columns, the method further comprising:  
3                    copying to a first one of the index columns the data values stored in the single  
4 data column for the first table in response to a request from the first tenant to index data in  
5 the first data field.

1                    14.     The method of claim 13, wherein copying includes converting the  
2 copied data values to a modified format.

1                    15.     The method of claim 14, wherein converting includes applying a case  
2 folding algorithm to the data values.

1                    16.     The method of claim 9, wherein said third data type is selected from  
2 the group consisting of said first data type, said second data type and a data type different  
3 from the first and second data types.

1                    17.     The method of claim 9, wherein when the first tenant creates a record  
2 for the first table, executing a process that determines whether the data value in the first data  
3 field for that record satisfies a threshold criteria, and if so, processing an action rule.

1                    18.     The method of claim 17, wherein the action rule indicates a recipient  
2 of a notification, the method further including automatically sending a notification message  
3 to the recipient.

1                    19.     The method of claim 9, further including defining an owner field for  
2 the first data table, wherein each data value stored in the owner field indicates an hierarchical  
3 user access level for the associated record.

1                   20.     A computer readable medium storing code for controlling a database  
2 system to store multiple fields for multiple tenants in a single multi-tenant data structure, the  
3 code comprising instructions to:  
4                   define a multi-tenant data structure having a plurality of data columns and one  
5 or more index columns;  
6                   define a first data field for a first tenant, said first field having a first data type;  
7                   define a second data field for a second tenant, said second field having a  
8 second data type, wherein the second data type is different than said first data type;  
9                   store the data values of first and second fields to a single column in the data  
10 structure when records having data values in the first and second fields are created by the first  
11 and second tenants, wherein the single column includes data values having different data  
12 types for different tenants; and  
13                   copy to a first one of the index columns the data values stored in the single  
14 data column for the first field in response to a request from the first tenant to index data in the  
15 first data field.

1                   21.     A computer readable medium storing code for controlling a database  
2 system to store multiple fields for multiple tenants in a single multi-tenant data structure, the  
3 code comprising instructions to:  
4                   define a multi-tenant data structure having a primary key column, an  
5 organization id column and a plurality of data columns;  
6                   define a first table for a first tenant, said first table having a first data field, and  
7 said first tenant having a first tenant id;  
8                   assign a first table id to the first table;  
9                   define a second table for a second tenant, said second table having a second  
10 data field, and said second tenant having a second tenant id;  
11                   assign a second table id to the second table;  
12                   wherein when records are created for the first table by the first tenant, for each  
13 created record:  
14                   a) store the value of the first data field to a single data column in the  
15 data structure;  
16                   b) store the first tenant id in the organization id column; and  
17                   c) store the first table id to the primary key column; and

18                    wherein when records are created for the second table by the second tenant,  
19    for each created record:  
20                    a) store the value of the second data field to said single data column in  
21            the data structure;  
22                    b) store the second tenant id in the organization id column; and  
23                    c) store the second table id to the primary key column; and  
24                    wherein the first and second tables of the first and second tenants are stored in  
25    the data structure.

1                    22.     A multi-tenant database system, comprising :  
2                    a database for storing multi-tenant data objects; and  
3                    a database management process configured to:  
4                    define a multi-tenant data structure in the database, the data structure having a  
5    plurality of data columns and one or more index columns;  
6                    define a first data field for a first tenant, said first field having a first data type;  
7                    define a second data field for a second tenant, said second field having a  
8    second data type, wherein the second data type is different than said first data type;  
9                    store the data values of first and second fields to a single column in the data  
10    structure when records having data values in the first and second fields are created by the first  
11    and second tenants, wherein the single column includes data values having different data  
12    types for different tenants; and  
13                    copy to a first one of the index columns the data values stored in the single  
14    data column for the first field in response to a request from the first tenant to index data in the  
15    first data field.

1                    23.     A multi-tenant database system, comprising :  
2                    a database for storing multi-tenant data objects; and  
3                    a database management process configured to:  
4                    define a multi-tenant data structure in the database, wherein the data structure  
5    has a primary key column, an organization id column and a plurality of data columns;  
6                    define a first table for a first tenant, said first table having a first data field, and  
7    said first tenant having a first tenant id;  
8                    assign a first table id to the first table;

9                   define a second table for a second tenant, said second table having a second  
10 data field, and said second tenant having a second tenant id;  
11                   assign a second table id to the second table;  
12                   wherein when records are created for the first table by the first tenant, for each  
13 created record:  
14                   a) store the value of the first data field to a single data column in the  
15 data structure;  
16                   b) store the first tenant id in the organization id column; and  
17                   c) store the first table id to the primary key column; and  
18                   wherein when records are created for the second table by the second tenant,  
19 for each created record:  
20                   a) store the value of the second data field to said single data column in  
21 the data structure;  
22                   b) store the second tenant id in the organization id column; and  
23                   c) store the second table id to the primary key column; and  
24                   wherein the first and second tables of the first and second tenants are stored in  
25 the data structure